

Claims

1. Steering device (10, 50, 60), in particular for vehicles, comprising a rotatable steering wheel (14) and a base part (18, 52) which does not rotate along with the steering wheel (14), wherein means are provided for transmitting data between the steering wheel (14) and the base part (18, 52), characterized in that the means are designed such that they transmit data between the steering wheel (14) and the base part (18, 52) in a contact-free manner using light signals.
2. Device (10, 50, 60) according to claim 1, characterized in that the means comprise at least one light transmitting unit (20) and/or at least one light receiving unit (22, 24).
3. Device (10, 50, 60) according to claim 1 or 2, characterized in that the means comprise light guides (26, 28, 30, 32, 34, 36) and/or light fingers (62, 64, 66).
4. Device (10, 50, 60) according to claim 1, 2 or 3, characterized in that at least one light transmitting unit (20) and at least one light receiving unit (22, 24) are disposed on the base part side, wherein the light signals are optically transmitted from the light transmitting unit (20) to the steering wheel (14) and from the steering wheel (14) to the light receiving unit (22, 24), each in a contact-free manner.
5. Device (10, 50, 60) according to any one of the preceding claims, characterized in that light switches and/or light buttons (38, 40) are disposed in the steering wheel (14) and are suited for switching the light signals.

6. Device (10, 50, 60) according to any one of the preceding claims, characterized in that one light transmitting unit (20) is preferably provided, wherein the light signals of the light transmitting unit (20) are fanned-out (42) in the steering wheel (14) and the fanned-out light signals pass light switches and/or light buttons (38, 40).
7. Device (10, 50, 60) according to any one of the preceding claims, characterized in that the light signals are encoded.
8. Device (10, 50, 60) according to claim 7, characterized in that the light signals are spectrally separated for encoding.
9. Device (10, 50, 60) according to claim 7 or 8, characterized in that the light signals are appropriately pulsed for encoding.
10. Device (10, 50, 60) according to any one of the preceding claims, characterized in that the light switches and/or light buttons (38, 40) are optically connected to different light receiving units (22, 24).
11. Device (10, 50) according to any one of the preceding claims, characterized in that the light transmitting unit (20) on the base part side transmits light signals in a contact-free manner into a light guide ring (26) disposed around the axis of rotation of the steering wheel on the steering wheel side, the light guide ring (26) being optically connected to the light switches and/or light buttons (38, 40).
12. Device (10, 50) according to claim 11, characterized in that at least one and preferably several light guide rings (28, 30) are provided about the axis of rotation of the steering wheel on the steering wheel side, into which the signals from the light switches and/or light buttons (38, 40) are guided.

13. Device (10, 50) according to claim 11 or 12, characterized in that the light guide ring(s) (26, 28, 30) is/are fed or scanned in a contact-free manner using light receiving units on the base part side.
14. Device (10, 50) according to any one of the claims 11 through 13, characterized in that feeding or scanning is carried out directly or indirectly, in particular via light fingers.
15. Device (10, 50) according to any one of the claims 11 through 14, characterized in that the light guide rings (26, 28, 30) are disposed next to each other along the axis of rotation (12).
16. Device (10, 50) according to any one of the claims 11 through 15, characterized in that the outer radii of the light guide rings (26, 28, 30) are at least largely identical.
17. Device (10, 50) according to any one of the claims 11 through 14, characterized in that the light guide rings (26, 28, 30) are disposed concentrically about the axis of rotation (12), in one plane.
18. Device (10, 50) according to any one of the claims 11 through 17, characterized in that the light transmitting unit (20) and the light receiving unit (22, 24) are disposed radially or axially next to the light guide rings (26, 28, 30).
19. Device (10, 50) according to any one of the claims 11 through 18, characterized in that the light guide rings (26, 28, 30) are designed as part of a code disc of a steering angle measuring means, which is rotationally coupled with the steering wheel (14).

20. Device (60) according to any one of the claims 1 through 10, characterized in that the light transmitting unit (20) transmits light signals into a light guide ring (26) disposed about the axis of rotation of the steering wheel on the base part side, which is scanned in a contact-free manner by at least one light finger (62) optically connected to the light switches and/or light buttons (38, 40).
21. Device (60) according to claim 20, characterized in that at least one and preferably several light fingers (64, 66) are disposed on the steering wheel side to transmit the light signals in a contact-free manner from the light switches and/or light buttons (38, 40) to light guide rings (28, 30) disposed about the axis of rotation (12) of the steering wheel (14) on the base part side.
22. Device (60) according to claim 20 or 21, characterized in that the light guide rings (26, 28, 30) are disposed in one plane in concentric circles about the steering axis (12).
23. Device (60) according to claim 20, 21 or 22, characterized in that the light guide rings (26, 28, 30) are disposed on the base part (18, 52) or are integrated in the base part (18, 52).
24. Device (10, 50, 60) according to any one of the preceding claims, characterized in that the at least one light transmitting unit (20) is designed as LEDs.
25. Device (10, 50, 60) according to any one of the preceding claims, characterized in that the at least one light receiving unit (22, 24) is designed as a photo transistor.

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26. Device (10, 50, 60) according to claims 23, 24 and 25, characterized in that the base part (18) is a printed circuit board (52) on which the LEDs (20) and/or photo transistors (22, 24) are disposed either directly or indirectly.